2013

Evaluation of Application Timing on Stratego YLD Efficacy of Field Corn in Nebraska, 2012

C. M. Schleicher
University of Nebraska-Lincoln

T. A. Jackson-Ziems
University of Nebraska-Lincoln, tjackson3@unl.edu

CORN (*Zea mays* L. 'DKC 64-83')
Gray leaf spot; *Cercospora zeae-maydis*
Common rust; *Puccinia sorghi*
Southern rust; *Puccinia polysora*

C.M. Schleicher and T.A. Jackson-Ziems
Department of Plant Pathology
University of Nebraska-Lincoln
448 Plant Science Hall
Lincoln, NE 68583-0722

Evaluation of application timing on Stratego YLD efficacy of field corn in Nebraska, 2012.

A foliar fungicide timing trial was conducted at the University of Nebraska-Lincoln South Central Agricultural Laboratory near Clay Center, NE. DeKalb corn hybrid DKC 64-83, rating of "good" (6 out of 9) for gray leaf spot (GLS), "very good" (4 out of 9) for common rust (CR), and "good" (5 out of 9) for southern rust (SR), was planted on 26 Apr in 30-in. rows at a target population of 30,600 plants/A. The trial area was disked with corn as the previous year's crop. Five foliar fungicide treatments and a non-treated control were replicated six times in a randomized complete block design. Each plot was four rows (10 ft) wide by 40 ft in length. Foliar fungicides were applied with a modified high-clearance sprayer. The 10 ft spray boom consisted of six nozzles (TeeJet XR11002) spaced 20-in. apart and 18-in. above the canopy. Each treatment was applied at 40 psi traveling at 3.0 mph resulting in a 20 gal/A application volume. Foliar fungicides were applied on 29 May at growth stage V6, 7 Jun at growth stage V7, 21 Jun at growth stage V11, and 6 Jul at reproductive stage R1. Although foliar disease was observed at very low severity levels throughout the growing season, GLS, CR, and SR severity was visually assessed by estimating percent leaf area covered with lesions over the entire plot on 29 May (V5), 12 Jun (V8), 6 Jul (R1), 2 Aug (R4) and 16 Aug (R5.25), and these data were used to calculate area under the disease progress curve (AUDPC). Stay green was visually assessed on 4 Sep (R5.75) as the average percentage of green leaf material remaining on the plant in each plot. Corn lodging was assessed on 25 Sep (R6) as the percentage of corn stalks lodged below the ear from 20 stalks pushed from the standing 12 o'clock position to the 2 o'clock position (45^{o} angle). Grain was mechanically harvested with a two-row research combine on 28 Sep. The ends of plots were trimmed prior to harvest and the harvested area of each plot was measured following harvest and used to calculate yield. All assessments (disease severity, stay green, and yield) were done in the two center rows of each plot, except push lodging was done in rows one and four. Trial data was analyzed in SAS using the Waller-Duncan K-ratio t Test at the P=0.05 significance level. Monthly rainfall and temperature readings were atypical during the growing season. High temperatures reached in the upper 90's to low 100's during the summer growing season, notably in Jul around the VT/R1 growth stage. The research farm received little to no precipitation during much of the growing season but supplemental water was added as needed by an overhead sprinkler linear irrigation system.

Common rust was the initial foliar disease observed in this trial, first seen on the 6 Jul assessment date. GLS and southern rust were both first observed in this trial on the 2 Aug assessment date. GLS, CR, and SR severity remained low through the entire growing season and no severity assessment exceeded 0.4% for any treatment on any rating date. GLS lesions were identified on the ear leaf by early- to mid-August. Common smut and Physoderma brown spot were observed sparsely through this trial and their severity was not assessed. There were significant differences between treatments for GLS, CR, and SR AUDPC and AUDPC calculations indicated all fungicide treatments reduced GLS, CR, and SR severity compared to the non-treated control. Stratego YLD 4.18 SC, 4 fl oz/A, V11 exhibited the lowest GLS AUDPC. The non-treated control exhibited the highest CR AUDPC value. SR AUDPC values decreased as the treatment applications were applied at later growth stages. Stay green percentage ranged from 18.3% to 21.7%. Stratego YLD 4.18 SC, 4 fl oz/A, V11, exhibited the lowest percentage of lodging at 5.8%. 500-count kernel weights ranged from 6.24 oz for the non-treated control and Stratego YLD 4.18 SC, 4 fl oz, R1 to 6.35 oz for Stratego YLD 4.18 SC, 4 fl /oz A, V11. The non-treated control had a yield of 260.0 bu/A. Yields for fungicide treatments ranged from 256.5 bu/A for Stratego YLD 4.18 SC, 4 fl oz/A, V11 to 264.2 bu/A for Stratego YLD 4.18 SC, 4 fl oz/A, V6. There were no significant differences between treatments for stay green percentage, lodging percentage, 500-count kernel weight, and yield.

Treatment, Rate/A, Timing	GLS AUDPC[z]	CR AUDPC	SR AUDPC	Stay Green (%)[y]	Lodging (%)[x]	500 Kernel Weight (oz)	Yield (bu/A)[w]
Non-Treated Control……..…	8.9 a[v]	6.0 a	3.3 a	21.3	11.7	6.24	260.0
Stratego YLD 4.18 SC[u], 2 fl oz, V6…..	8.4 a	5.8 ab	3.1 a	18.3	13.3	6.31	257.7
Stratego YLD 4.18 SC[u], 4 fl oz, V6…..	5.6 ab	5.7 ab	2.9 ab	20.0	12.5	6.34	264.2
Stratego YLD 4.18 SC[u], 4 fl oz, V7…..	4.7 ab	5.7 ab	2.9 ab	21.7	9.2	6.33	259.1
Stratego YLD 4.18 SC, 4 fl oz, V11…..	2.9 b	5.3 b	1.6 bc	17.9	5.8	6.35	256.5
Stratego YLD 4.18 SC[u], 4 fl oz, R1…...	5.5 ab	5.3 b	1.4 c	21.3	10.0	6.24	259.1
Coefficient of Variation (%)	53.9	8.2	42.6	20.2	82.0	2.4	4.4

[z]Area under the disease progress curve.
[y]Stay green was estimated as the percentage of green leaves remaining on the plant.
[x]Lodging was estimated as the percentage of corn stalks lodged below the ear from 20 stalks pushed to arm's length.
[w]Yield calculations adjusted to a moisture content of 15.5%.
[v]Data followed by the same letter or without letters within a column are not statistically different (P > 0.05) according to the Waller-Duncan k-ratio t Test.
[u]Treatment included NIS, 0.25% V/V.